

Two new species of *Morinda* L. (Rubiaceae) from north east Queensland

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Summary

Halford, D.A. & Ford, A.J. (2004). Two new species of *Morinda* L. (Rubiaceae) from north east Queensland. *Austrobaileya* 6(4): 895-902. *Morinda podistra* and *M. ammitia* are described, illustrated and diagnosed against related species. Notes on habitat and distribution are provided for each species.

Key words: *Morinda*, taxonomy, Australian flora, *Morinda podistra*, *Morinda ammitia*, Rubiaceae

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Introduction

The genus *Morinda* L. comprises approximately 80 species mostly in the Old World tropics (Mabberley 1997). Currently six named species of *Morinda* are recorded in Australia, namely *M. bracteata* var. *celebica* (Miq.) Valetton, *M. canthoides* (F.Muell.) Halford & R.J.F.Hend., *M. citrifolia* L., *M. jasminoides* A.Cunn. ex Benth., *M. reticulata* Benth. and *M. umbellata* L. In this paper we describe two new species endemic to north east Queensland.

Methods

The study is based upon the examination of herbarium material from BRI and QRS with field observations by the second author of both new species. The Herbarium acronyms follow Holmgren *et al.* (1990). All specimens cited have been seen by one or both authors.

Measurement of floral parts are based on material preserved in 70% ethanol or dried material reconstituted by placing in boiling water for a few minutes. The compound fruit formed by the fusion of a number of ovaries in species of *Morinda* as well as in some other genera of the tribe Morindeae has been described by the term syncarp by many authors (e.g. Johansson 1987, Robbrecht 1988, Johansson 1988). Igersheim and Robbrecht (1993) have pointed out that this is an inappropriate term and should be avoided. In this paper the term "compound syncarpous drupe" is used to describe the compound fruit.

The term "drupe" is used here as defined by Clifford and Dettmann (2001).

Taxonomy

Morinda podistra Halford & A.J.Ford, sp. nov.

M. umbellatae similis autem foliis maturis apice acuminato plus extenso praeditis et indumento pilis antrorsis in ramulosis, in pedunculis et in pagina inferiore folii vestita differt. **Typus:** Queensland. COOK DISTRICT: Daintree River National Park, Black Mountain area, Daintree River headwaters, 25 May 1998, P.I. Forster PIF22959, R. Jago, R. Jensen & R. Booth (holo: BRI).

Morinda sp. (Mt Lewis L.W.Jessup+ GJM228), Forster and Halford (2002).

Twining vine, to 4m high, or rarely a scandent shrub. Stem and main branches slender, ± smooth to longitudinally striated, 3–6 mm diameter. Branchlets terete, scabrid, moderately dense to densely hairy, glabrescent; hairs simple, antrorse, ascending to spreading, up to 0.6 mm long. Leaves petiolate, opposite; stipules interpetiolar, sheathing, 1–5 mm long, truncate at apex, moderately dense to densely hairy with hairs as for branchlets; petioles 1–5 mm long; laminae ± chartaceous, narrowly obovate-elliptic or narrowly elliptic, 2.5–10 cm long, 0.7–3 cm wide; base attenuate; margins entire, slightly recurved (when dry); apex acuminate; adaxial surface usually glabrous and smooth or rarely with scattered, short, antrorse hairs and then scabrid; abaxial surfaces sparsely to moderately hairy especially along midvein

and secondary veins, scabrous; hairs simple, antrorse, appressed to ascending, up to 0.9 mm long; venation brochidodromous with 4–8 lateral veins per side of midvein, slightly raised on adaxial surface, prominent on abaxial surface; midvein conspicuously raised on adaxial surface, prominent on abaxial surface; tuft-domatia present in lateral vein axils on abaxial surface. Flowers usually 4-merous (rarely 3 or 5-merous), bisexual or unisexual (?), sessile, in congested capitula, the flowers joined at least by the base of the gynoecium. Capitula pedunculate in terminal umbels with 2–4 (often 2) capitula per umbel, \pm globose, 3–4 mm across (excluding corollas), 6–12 flowered, with colleters present between flowers; peduncles 2–10 (–15) mm long, moderately dense to densely hairy with hairs as for branchlets. Calyx tube green, 0.6–0.9 mm long, c. 1.5 mm across, glabrous to minutely and sparsely hairy abaxially and glabrous adaxially, truncate. Corolla valvate, deciduous, cream, turning creamy yellow with age, sparsely to densely hispidulous on abaxial surface with hairs up to 0.1 mm long; tube 1.3–2 mm long, the middle of the tube is fenestrated by short longitudinal slits, slightly widened at the apex, glabrous adaxially but densely hairy at mouth; hairs simple, up to 0.8 mm long; lobes spreading, ovate, 1.8–2.2 mm long, 1.1–1.7 mm wide, with a small subapical appendage on abaxial surface, sparsely to densely hairy adaxially, acute and \pm cucullate at apex. Stamens exserted; filament 0.5–1 mm long, inserted c. 0.3 mm below the sinuses of the corolla lobes; anthers dorsifixed, linear-oblong, 1.0–1.3 mm long, dehiscing laterally. Disc entire, convex, c. 0.3 mm high, glabrous. Ovary 2-celled, biovulate, with false septum in the upper part appearing to divide each cell into 2; style c. 1 mm long, glabrous; stigma bifid, with erect lobes 0.3–0.8 mm long, adaxial surface papillate, abaxial surface with minute, scattered, antrorse hairs. Fruit a compound syncarpous drupe, orange when ripe, subglobose, 8–10 mm across, persistent calyx tubes prominent on surface, minutely and sparsely hairy; colleters enlarged and fleshy; mesocarp fleshy, containing several pyrenes; pyrenes \pm ellipsoid, dorsiventrally compressed, 3–3.5 mm long, 2.5–3 mm wide, c. 1.7 mm thick, 1-seeded; endocarp cartilaginous, brown, \pm rugose, with basal marginal groove. Seeds irregularly shaped but usually 3-faced,

c. 2.8 mm long, c. 1.7 mm wide, c. 1.2 mm thick; testa membranous, dark brown; endosperm starchy and hard; embryo c. 1 mm long, straight; cotyledons very thin, about the same length as, but slightly wider than, the radicle. **Fig. 1.**

Additional specimens examined: Queensland. COOK DISTRICT. slopes of Mt Lewis, Feb 1932, *Brass* 2083 (BRI); Mt Lewis, a few km down from hut, Mt Lewis Forest Reserve, Jan 2002, *Cooper* WWC1659 & *Ford* (BRI); Mt Lewis Forest Reserve, 26 km along Mt Lewis road, near creek down from hut, Dec 2001, *Cooper* WWC1632 *et al.* (BRI, QRS); edge of Zarda Camp Clearing Upper Mossman River, Sep 1936, *Flecker* NQNC2331 (QRS); Mt Lewis FR, 1 km E of peak “1243”, Dec 2002, *Ford* 3782 & *Holmes* (BRI); *ditto*, *Ford* 3784 & *Holmes* (BRI); summit of Devil’s Thumb, Mossman Gorge NP, Apr 1986, *Godwin* C3091 (BRI); SFR 143, North Mary logging area, Dec 1977, *Gray* 828 (QRS); Mt Lewis, Sep 2002, *Halford* Q7400 & *Ford* (BRI); SFR 143, North Mary logging area, Dec 1974, *Hyland* 7909 (BRI, QRS); SFR 143, North Mary logging area, Nov 1974, *Hyland* 7887 (QRS); SFR 143, Nov 1974, *Irvine* 1066 (BRI, QRS); Mt Lewis Rd, S Mary logging area, 16 km NNW [of] Mt Molloy, Nov 1988, *Jessup* GJM1472 *et al.* (BRI); Mt Lewis Rd near Half Ton Creek crossing, about 30 km from Rex Highway, Nov 1988, *Jessup* GJM29 *et al.* (BRI); Mt Misery E of Mt Spurgeon, 15.4 km NNE [of] Mt Carbine, Nov 1988, *Jessup* GJM971 *et al.* (BRI); Mt Lewis Rd, 28 km from Mt Molloy – Mossman Rd, Jan 1981, *Jessup* 282 & *Clarkson* (BRI); Mt Lewis Rd boundary of Round logging area and Carbine logging area, 20 km NNW [of] Mt Molloy, Nov 1988, *Jessup* GJM288 *et al.* (BRI); Mossman Coast Range, Apr 1992, *Russell* 28 (BRI); Near Schillers Hut, Mt Spurgeon, Sep 1972, *Webb* & *Tracey* 11799 (BRI); Mt Lewis, Oct 1971, *Webb* & *Tracey* 10510 (BRI).

Distribution and habitat: *Morinda podistra* is endemic to north east Queensland, where it is currently known from the Mt Lewis–Mt Spurgeon area, west of Mossman, on the Mount Carbine Tableland and the Main Coast Range (**Map 1**). It is recorded as growing in simple and complex notophyll vine forest, and simple microphyll vine-fern thicket communities on soils derived from granite substrates at altitudes of 1000 to 1330 m. *Morinda podistra* appears to be more common in the microphyll vine-fern thicket communities amongst granite boulders, which have a low and broken canopy, than in the notophyll vine forests. Common canopy trees include: *Sphalmium racemosum* (C.T.White) B.G.Briggs, B.Hyland & L.A.S.Johnson, *Syzygium endophloium* B.Hyland, *Garcinia brassii* C.T.White, *Flindersia pimenteliana* F.Muell. f. *pimenteliana*, *Niemeyera* sp. (Mt Lewis A.K.Irvine 1402), *Balanops australiana*

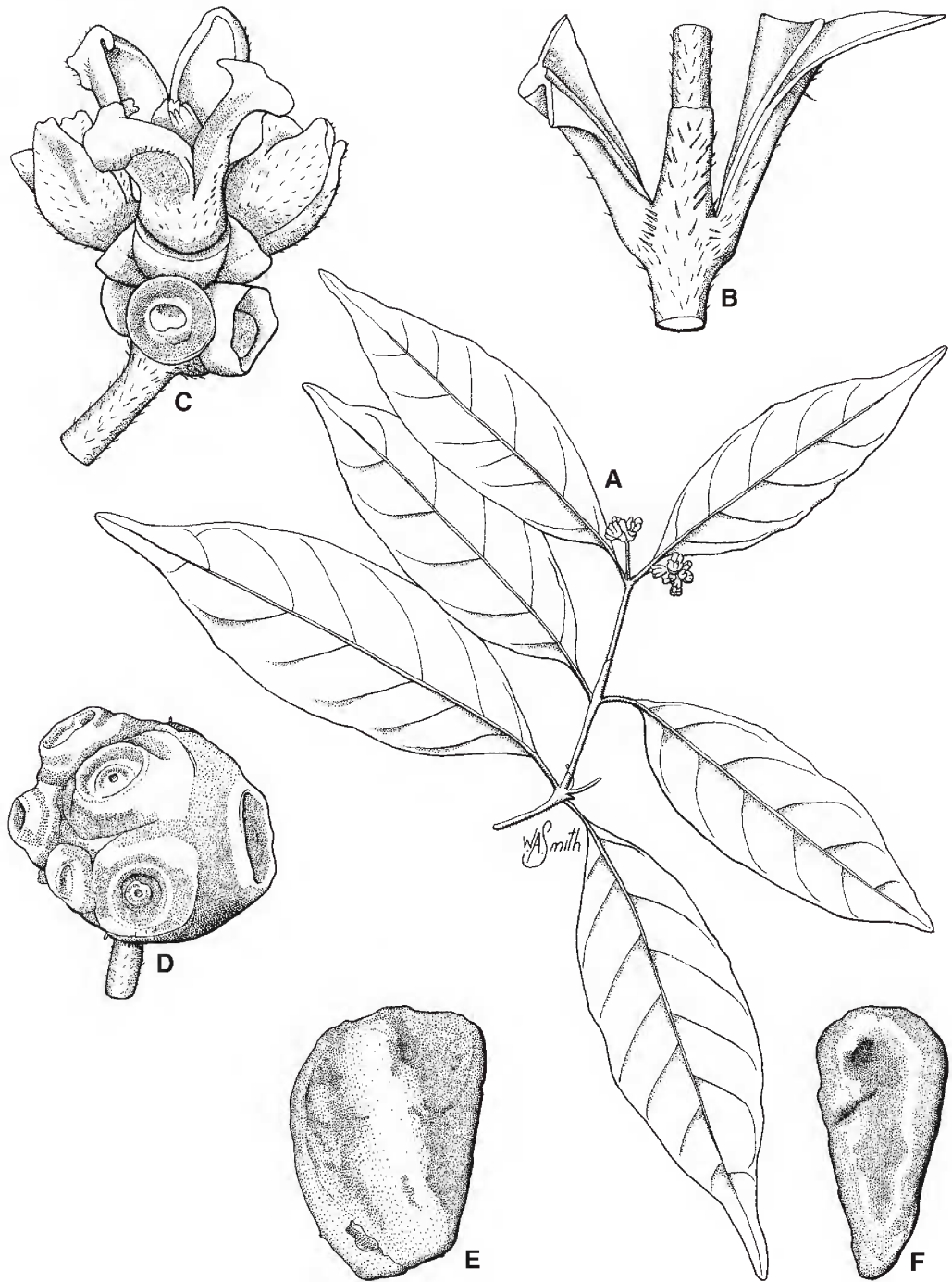


Fig. 1. *Morinda podistra*. A. branchlet with flowers $\times 1$. B. branchlet node with stipules and leaf bases $\times 6$. C. inflorescence $\times 8$. D. compound fruit $\times 4$. E. adaxial view of pyrene $\times 12$. F. lateral view of pyrene $\times 12$. A from Ford 3782 & Holmes (BRI); B from Halford Q7400 & Ford (BRI); C from Ford 3784 & Holmes (BRI); D-F from Ford 3871 & Holmes (BRI). Del. W. Smith.

F. Muell., *Halfordia kendack* (Montrouz.) Guillaumin and *Uromyrtus metrosideros* (F.M. Bailey) A.J. Scott. Common shrubs and understory plants include: *Chionanthus axillaris* R.Br., *Mischocarpus pyriformis* subsp. *retusus* (Radlk.) R.W. Ham, *Alyxia orophila* Domin, *Agapetes meiniana* F. Muell. *Oraniopsis appendiculata* (F.M. Bailey) J. Dransf., A.K. Irvine & N.W. Uhl, *Rapanea* sp. (Zarda LA B.P. Hyland 6898) and *Lomandra hystrix* (R.Br.) L.R. Fraser & Vickery.

Phenology: Flowers have been recorded from November to January whilst fruits have been recorded in April and May.

Affinities: *Morinda podistra* resembles *M. umbellata*, but differs from that species by its mature leaves that have a longer drawn out acuminate apex and the antrorse hairs that are present on the branchlets, peduncles and abaxial leaf surface. *Morinda podistra* and *M. umbellata* are known to co-exist in the Mt Lewis area.

Notes: *Morinda podistra* is commonly observed as growing on soil substrate. However, it has also been observed as a lithophyte, where it produces adventitious roots along the stem.

The new leaf growth of *M. podistra* is pale green. Expanding stipules, recently produced nodes, petioles, twigs and peduncles are usually purplish in colour. Flower bud colour has been recorded as being pinkish, or purplish at the base of the corolla.

The flowers from the collections *Ford* AF3784 (BRI), *Jessup* GJM228 *et al.* (BRI) and *Jessup* GJM971 *et al.* (BRI) are tentatively interpreted as being unisexual as they have pollen producing anthers but lack a style of any description, although the ovary is well developed with what appear to be functional ovules. The flowers from collections *Gray* 828 (QRS), *Cooper* WWC1632 *et al.* (BRI), *Jessup* GJM771 *et al.* (BRI), *Anon.* [AQ456135] (BRI) and *Irvine* 1066 (BRI) appear to be bisexual with a well developed style, stigma, ovary and pollen producing anthers. Further flowering material and field investigations are required to assess what reproductive strategies are present in this species.

Conservation status: *Morinda podistra* has an apparently restricted and narrow distribution. However it is locally common within its habitat in this range. All of the cited specimens have been collected from within the World Heritage Area of the Wet Tropics bioregion. Also, a number of collections have been made in the Daintree National Park. It is not considered at risk at this time.

Etymology: The specific epithet *podistra* is Greek meaning ‘foot trap’. As intrepid bushwalkers will testify, the wiry stems of this species often form dense stands in which backpacks and feet get caught.

***Morinda ammitia* Halford & A.J. Ford, sp.**

nov. *M. bracteata* var. *celebicae* nonnihil similis autem caulibus pubescentibus, foliis pubescentibus, fructibus pubescentibus (glabris in *M. bractata* var. *celebica*), corollae tubis brevioribus (1.5–3.5 mm vice c. 10 mm in *M. bracteata* var. *celebica*), habitu scandenti (habitu fruticis usque arboris parvae in *M. bracteata* var. *celebica*) et lobis calycis foliaceis carentibus differt.
Typus: Queensland. COOK DISTRICT: Cooktown – Isabella Road, c. 200 m E of Isabella Falls, 13 March 2001, A. Ford AF2697 & J. Holmes (holo: BRI; iso: DNA, NSW distribuendi).

Morinda sp. (Altanmoui Range B.P. Hyland 6323), Forster and Halford (2002).

Vine or scandent shrub with long arching, non-twining, stems. Stem and main branches not seen. Branchlets \pm quadrangular when young becoming \pm terete and striated with age, moderately dense to densely hairy; hairs simple, ascending to spreading, 0.1–0.7 mm long. Leaves petiolate, opposite; stipules interpetiolar, sheathing, 1–2 mm long, produced into a narrow triangular lobe up to 2 mm long, hairs as for branchlets; petioles 2–5 mm long; laminae \pm coriaceous, narrowly obovate-elliptic, narrowly elliptic to elliptic, 4.5–9 cm long, 2.5–5.6 cm wide; base cuneate; margins entire, slightly recurved; apex obtuse to rounded, acute or sometimes shortly acuminate; adaxial and abaxial surfaces glabrous, scabrid or sparsely to moderately hirtellous, indumentum usually slightly denser

on abaxial surface; hairs simple, spreading to ascending, up to 0.8 mm long; venation brochidodromous with 5–10 lateral veins per side of midvein, slightly raised on adaxial surface, prominent on abaxial surface; midvein slightly raised on adaxial surface, prominent on abaxial surface; tuft-domatia present in lateral vein axils on abaxial surface. Flowers 4 or 5-merous, bisexual or unisexual (?), sessile, in congested capitula, the flowers joined at least by the base of the gynoecium. Capitula pedunculate in terminal umbels with 2–4 capitula per umbel or solitary in upper leaf axils, rarely a solitary sessile flower or a rudimentary capitulum present at base of peduncles, \pm globose, 8–12 mm across (excluding corollas), 12–30-flowered with colleters absent between flowers; peduncles 10–23 mm long, (elongating to 30 mm in fruit), terete, often striated, moderately dense to densely hairy with hairs as for branchlets. Calyx tube yellow-green, c. 2 mm long, c. 2.5 mm across, moderately to densely hispidulous adaxially with simple hairs up to 0.2 mm long, densely hairy abaxially with appressed to spreading simple hairs up to 0.3 mm long, truncate, undulate or irregularly and shallowly toothed. Corolla valvate, deciduous, greenish cream to white, hispidulous on abaxial surface; tube 1.5–3.5 mm long, the middle of the tube is fenestrated by short longitudinal slits, slightly widened at the apex, glabrous adaxially but densely hairy towards mouth; hairs simple, up to 1 mm long; lobes spreading and recurved distally, narrowly triangular to triangular, 3–4 mm long, 1.5–2 mm wide, acute and \pm cucullate at apex, sparsely to densely hairy adaxially, glabrous towards apex. Stamens exserted; filament 0.5–1.7 mm long, inserted c. 0.5 mm below the sinuses of the corolla lobes; anthers, dorsifixed, linear-oblong, 1.3–2 mm long, minutely hairy, dehiscing laterally. Disc entire, flat, c. 0.5 mm high, sparsely covered with minute simple hairs. Ovary 2-celled, biovulate, with false septum in the upper part appearing to divide each cell into 2; style 0.8–1.5 mm long, included in corolla tube, glabrous; stigma bifid, with erect lobes c. 1.5 mm long, adaxial surface papillate, abaxial surface glabrous. Fruit a compound syncarpous drupe, black when ripe, subglobose, 20–30 mm across, hispidulous, persistent calyx tubes prominent on surface, mesocarp fleshy, containing several pyrenes; pyrenes \pm ellipsoid

or obovoid, dorsiventrally compressed, 5–6 mm long, 2.5–4 mm wide, 1.8–2.2 mm thick, 1-seeded; endocarp cartilaginous, pale brown, \pm smooth, with basal marginal groove. Seeds c. 4 mm long, c. 2 mm wide, c. 1.6 mm thick; testa membranous, dark brown; endosperm corneous, \pm white; embryo (most seeds lacking an embryo) c. 2 mm long, straight, surrounded by a sticky and gelatinous membrane; cotyledons thin, shorter than but slightly wider than the radicle. **Fig. 2.**

Additional specimens examined: Queensland. COOK DISTRICT. Turtle Rock, 12 km SSE of Laura, Nov 1991, *Bean* 3803 (BRI); Isabella Creek, about 27 miles [c. 43 km] NW of Cooktown, Jun 1968, *Brass* 33836 (QRS); Laura sandstone area N of Laura River near Early Man site, May 1975, *Byrnes* 3312 (BRI); Split Rock Gallery, 14 km S of Laura on the Peninsula Development Rd, Oct 1984, *Clarkson* 5635A (BRI, QRS); Cape Melville NP, Altanmoui Range section, 7 km SE of Wakooka Outstation, Oct 1992, *Fell* DGF2703 & *Stanton* (BRI, QRS); Split Rock Gallery, 14 km S of Laura on the Peninsula Development Rd, Jul 1994, *Gray* 5764 (QRS); Isabella – Melvor road, 200 m from Isabella Falls, NW of Cooktown, Nov 2002, *Ford* 3719 & *Holmes* (BRI); Gugu Yalangi (Laura), Sep 1976, *Hyland* 9041 (BRI, QRS); Altanmoui, Jul 1972, *Hyland* 6323 (BRI, QRS); Cape Melville, Sep 1970, *Hyland* 4660 (BRI); 16 km SE of Laura, Jun 1976, *Jackes* [AQ168531] (BRI); between Battle Camp and Isabella Ck on Laura Station – Cooktown Rd, Nov 1979, *Webb & Tracey* 13411 (BRI, QRS); 9 miles [c. 14 km] S of Laura on main Mareeba – Coen Rd, Oct 1969, *Webb & Tracey* 9917A (BRI); Laura Galleries, a few km S of Laura on Mareeba – Coen Rd, Nov 1979, *Webb & Tracey* 13395 (BRI); Kennedy River, Aug 1966, *Volck* AFO3303 (QRS).

Distribution and habitat: *Morinda ammitia* is endemic to north east Queensland, where it is known from Cape Melville to the Cooktown – Laura area (**Map 1**). It is recorded as growing in open forest and low woodland communities, at the base of sandstone cliffs, in deciduous vine thicket, in low open eucalypt woodland and heath-like communities on sandstone escarpments. Associated dominant trees include: *Corymbia hylandii* (D.J.Carr & S.G.M.Carr) K.D.Hill & L.A.S.Johnson, *Eucalyptus phoenicea* F.Muell., *Eucalyptus crebra* F.Muell. and *Blepharocarya involucrigera* F.Muell. Large shrubs include: *Acacia flavescens* A.Cunn. ex Benth., *Parinari nonda* F.Muell. ex Benth. and *Erythrophleum chlorostachys* (F.Muell.) Baill. Small shrubs include: *Alyxia spicata* R.Br., *Hibbertia banksii* (R.Br. ex DC.) Benth. and *Phyllanthus/Sauropus* spp. Conspicuous understorey genera include: *Xanthorrhoea*, *Pandanus* and *Heteropogon*.

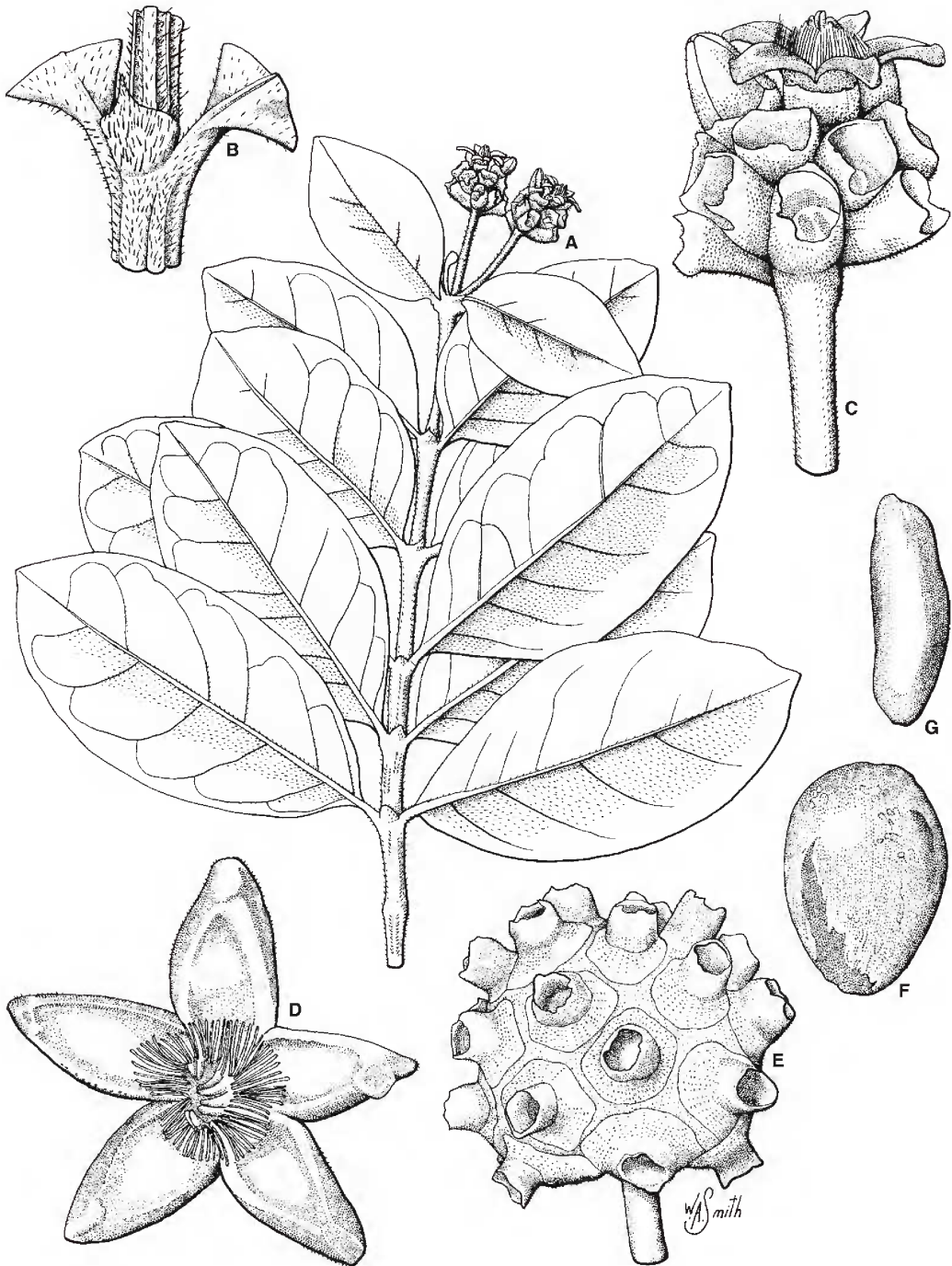


Fig. 2. *Morinda ammitia*. A. branchlet with flowers $\times 0.8$. B. branchlet node with stipules and leaf bases $\times 4$. C. inflorescence $\times 6$. D. flower viewed from above $\times 8$. E. compound fruit $\times 2$. F. adaxial view of pyrene $\times 6$. G. lateral view of pyrene $\times 6$. A–D from Ford 3719 & Holmes (BRI); E–G from Ford AF2697 & Holmes (BRI). Del. W. Smith.

Phenology: Flowers have been recorded from June to December, whilst fruits have been recorded in March, May and July.

Affinities: *Morinda ammitia* is somewhat similar to *M. bracteata* var. *celebica* but differs from that species in its hairy stems, leaves and fruits; (glabrous for *M. bracteata* var. *celebica*); shorter corolla tubes (1.5–3.5 mm long compared with c. 10 mm long for *M. bracteata* var. *celebica*); scandent habit (shrub to small tree for *M. bracteata* var. *celebica*); and the lack of foliaceous calyx lobes.

Notes: Flower buds have been recorded as having yellowish corolla lobes. The flowers from collections Hyland 6323 (QRS), Clarkson 5635A (BRI), Bean 3803 (BRI) and Fell & Stanton DGF2703 are tentatively interpreted as being unisexual as they have pollen producing anthers but lack a style of any description, although the ovary is well developed with what appear to be functional ovules. The summit of the ovary has an orifice, as does the bisexual flower after the style has shed. The flowers from collections Ford 3719 (BRI, QRS) and Ford 3720 (BRI, QRS) appear to be bisexual with a well developed style, stigma, ovary and pollen producing anthers. Further flowering material and field investigations are required to assess what reproductive strategies are present in this species.

Conservation status: *Morinda ammitia* is assessed as data deficient. Three collections have been made from Cape Melville National Park while other collections are from populations outside of conservation reserves.

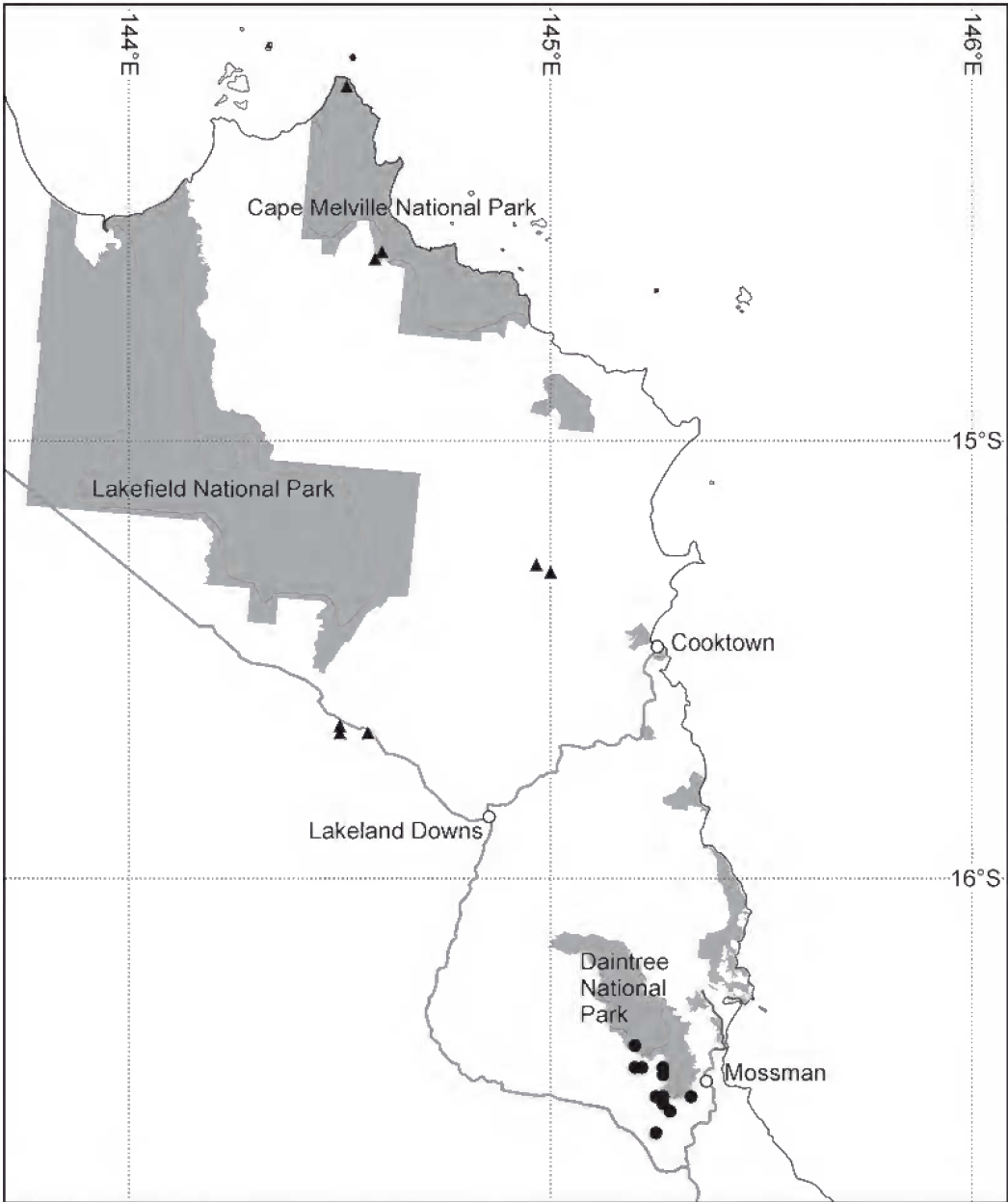
Etymology: The specific epithet is from the Greek *ammites*, sandstone; in reference to the species occurrence on sandstone substrates.

Acknowledgements

The authors wish to thank Will Smith for the illustrations, Peter Bostock for the maps, Les Pedley for the translation of the diagnoses into Latin and suggestions regarding the specific epithet “*ammitia*”. The first author would like to thank Gordon Guymmer, Director of BRI, for making available working space and facilities at BRI. Permits to traverse and collect in the Mount Lewis Forest Reserve were issued by the Queensland Parks and Wildlife Service. Jenny Holmes (Atherton) provided invaluable field assistance.

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Map 1. Distribution of *Morinda podistra* ● and *Morinda ammitia* ▲.